

Response to “On the uncanny capabilities of consequential LCA” by Sangwon Suh and Yi Yang (Int J Life Cycle Assess, doi: 10.1007/s11367-014-0739-9)

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To the editor:

We thank our colleagues Sangwon Suh and Yi Yang for presenting an opportunity to clarify aspects of our recent paper *Using Attributional Life Cycle Assessment to Estimate Climate-Change Mitigation Benefits Misleads Policy Makers*, published in the Journal of Industrial Ecology (Plevin et al. 2013). We encourage readers to compare the claims made by Suh and Yang to what actually appeared in our article. We focus in this letter on what we see as the key problems with Suh and Yang’s commentary: they present straw-man arguments and do not address our actual claims about consequential LCA (CLCA) and attributional LCA (ALCA).

Suh and Yang present straw-man arguments. The title of the article by Suh and Yang notwithstanding, we do not believe and in our paper did not imply that CLCA possesses uncanny abilities. Indeed, we presented important limitations of CLCA. For example, we wrote:

“Expanding the analytic scope of LCA to incorporate markets and other complex system dynamics—for example, by relying on partial or general equilibrium modeling—broadens and changes the nature of the uncertainty in LCA results. ... CLCA also involves substantial parametric uncertainty while adding the scenario dependence and uncertainty inherent to all projections of the future. Moreover, complex, multifaceted, interdisciplinary problems, such as estimating the net climate effects of alternative policies, engender multiple

perspectives and evaluation frameworks, yielding divergent outcomes that can be equally plausible.”

Moreover, we do not argue that the use of economic equilibrium models is a panacea as suggested by Suh and Yang. As the quote above suggests, we are aware of the limitations of using standard economic models to represent complex, long-term, global phenomena. We agree with Suh and Yang’s argument that typical economic equilibrium models do not fully account for the “inherent indeterminacy and complexity of socioeconomic dynamics” (Suh and Yang, p. 2). The point of our paper was not to explore in detail the limitations of economic models, but rather to show that critical differences between the way ALCA and CLCA are conceived and practiced render ALCA unsuitable for some of the problems to which it is applied.

Suh and Yang do not address our main arguments that ALCA does not estimate climate-change mitigation benefits. Two key points of our article are that (i) an oversimplified analytical framework such as ALCA can produce results that misinform decision-makers, and (ii) ignoring uncertain aspects of a problem does not produce a less uncertain result. As regards oversimplification, we argue that, for example, estimating climate-change mitigation benefits requires consideration of market-mediated “leakage” of greenhouse gas emissions occurring outside the analytical boundary of ALCAs (e.g., Chomitz 2002; Babiker 2005). This necessarily involves economic theory in some form, whether through simple application of elasticities, agent-based modeling, partial/general equilibrium modeling, or some other approach. Simply ignoring market dynamics—as is the case in most ALCAs—cannot produce a reasonable estimate of mitigation benefits in any case where market effects are important, as in the case of biofuels (Bento et al. 2014).

As regards uncertainty, in our view, the most scientifically responsible approach is to include in the analysis all

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phenomena believed to be important to the result—regardless of the magnitude of uncertainty—and to restrict claims resulting from the analysis to those that are robust despite the uncertainty. If uncertainty prevents a clear determination of benefits, then it is critically important to convey this finding to policy-makers. Excluding known uncertainties from the analysis and then presenting inappropriately precise results to policy-makers strikes us as a form of scientific malpractice.

Finally, we do not argue against *all* uses of ALCA, but rather against its use to estimate climate change mitigation benefits, as the title of our article states. This use is pervasive in the academic literature, bioenergy certification systems, and reports intended to inform policy-makers, e.g., by the International Energy Agency and the IPCC. We hasten to note, as we did in the article, that we, too, have used ALCA to estimate climate change mitigation benefits in our prior work. However, research by ourselves (Plevin et al. 2010; Delucchi 2011; Creutzig et al. 2012; Delucchi 2013; Rajagopal and Plevin 2013) and others has convinced us that a broader analysis that incorporates uncertainty is essential if we are to correctly inform policy-makers. As noted in our article, we believe that evaluating policy outcomes within a “robust decision-making” framework (see, e.g., Lempert and Groves 2010; McInerney et al. 2012) would be a particularly useful approach for climate-related policy decisions.

We encourage interested readers to read the letters regarding our article, and our response to them, in the Journal of Industrial Ecology.

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